CMA-10/10CE

SPECIFICATIONS

Power requirements
CMA-10 : 120 V AC, 60 Hz
CMA-10CE : 220V/240 V AC, 50 Hz
Power consumption
25 W
Inputs and outputs
VIDEO OUT : BNC type
Video 0.7 Vp-p, sync 0.3 Vp-p,
75 ohms, unbalanced, sync negative
DC OUT/VIDEO IN : BNC type
DC 28 V
Video 0.7 Vp-p, sync 0.3 Vp-p,
75 ohms, unbalanced, sync negative
REMOTE : BNC type
Serial data
Operating temperature
0°C to +40°C (32°F to 104°F)
Storage temperature
−10°C to +60°C (+ 14°F to +104°F)
Dimensions Approx. 105 × 100 × 230 mm (w/h/d)
($4^1/_4 \times 4 \times 9^1/_8$ inches)
Weight Approx. 2.5 kg (5 lb 8 oz)
Accessory supplied
AC power cord (1)

SONY®
SERVICE MANUAL

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

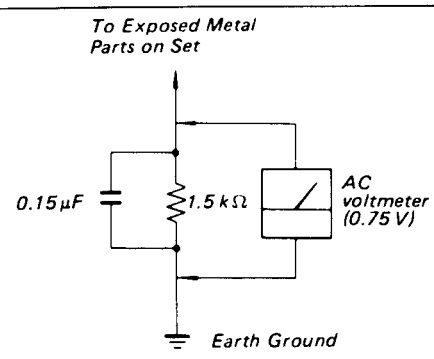

Fig. A. Using an AC voltmeter to check AC leakage.

SAFETY RELATED COMPONENT WARNING

Components identified by shading and ⚠ marked on the schematic diagrams and parts list are critical to safe operation. Replace these components with SONY parts whose part numbers appear as shown in this manual or in supplements published by SONY.

LEAKAGE CURRENT MEASUREMENT WARNING (ONLY FOR USA MODEL)

Before returning the set to the customer, confirm the leakage current is less than 0.1mA;

1. Between all exposed metal parts and any exposed metal parts having a return to chassis, and
2. Between exposed metal and earth ground.

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SECTION 1
DESCRIPTION

This instruction manual covers two camera AC adaptor models: the CMA-10 and the CMA-10CE. The operating procedures for the CMA-10 and for the CMA-10CE are the same. The only differences between these models are their power requirements and their connected color video cameras.

	Power requirements	Color video camera to be connected
CMA-10	120 V AC, 60 Hz	DXC-102
CMA-10CE	220/240 V AC, 50 Hz	DXC-102P

OWNER'S RECORD

The model and serial numbers are located at the rear of the unit. Record these numbers in the spaces provided below. Refer to them whenever you call upon your Sony dealer regarding this product.

Model No. _____ Serial No. _____

The shielded interface cable recommended in this manoual must be used with this equipment in order to comply with the limits for a computing device pursuant to Subpart J of Part 15 of FCC Rules.

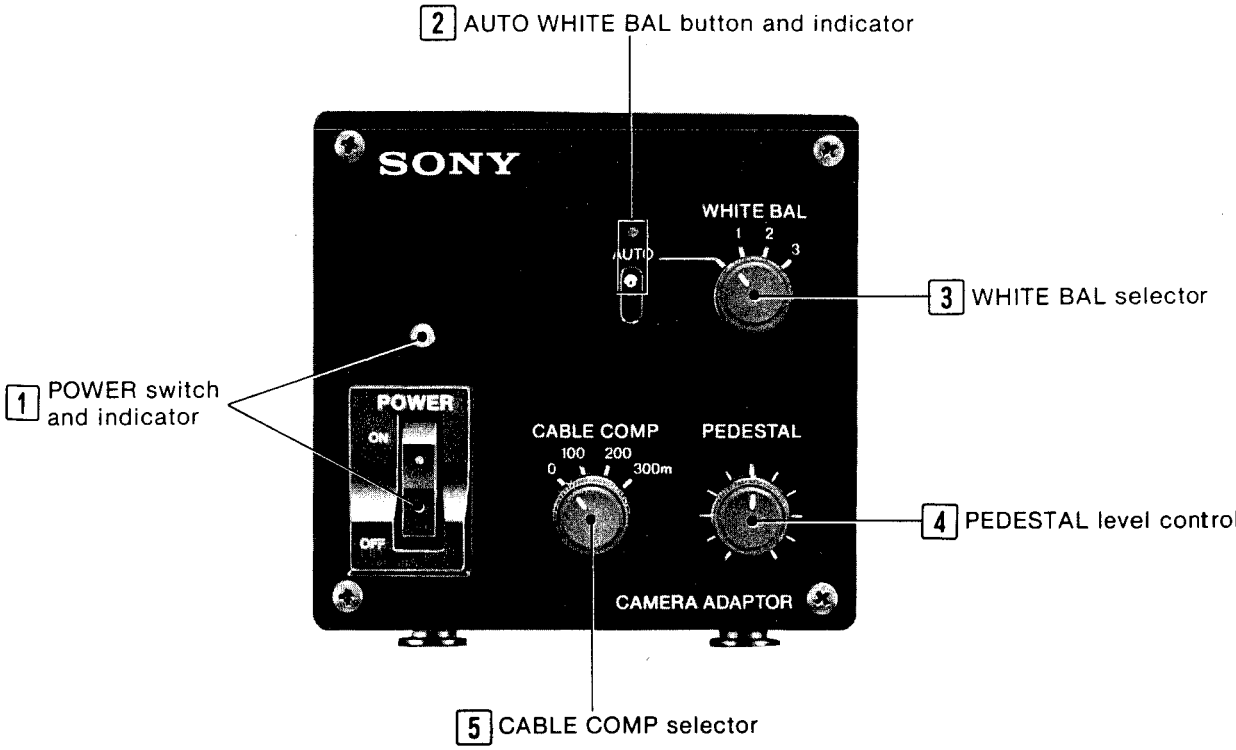
OUTLINE OF THE UNIT

The CMA-10/10CE is a camera AC adaptor designed for use with the Sony DXC-102/102P color video camera.

- The power to the camera and the video signal from the camera can be supplied and received through a single coaxial cable.
- This unit permits remote control of the white balance and pedestal level adjustments.
- This unit compensates for the loss of the signal caused by camera cable extensions up to 300 m (990 feet).
- It is possible to mount four CMA-10/10CE units into a 19-inch standard rack.

LOCATION AND FUNCTION OF PARTS

Front panel



1 POWER switch and indicator
Press the ON side of this switch to turn on the power to this unit. The indicator will light up.

2 AUTO WHITE BAL (automatic white balance adjustment) button and indicator (green)
When the REMOTE connector of this unit and that of the camera are connected, press this button to adjust the white balance automatically. After the adjustment is completed, the indicator lights up for a few seconds.

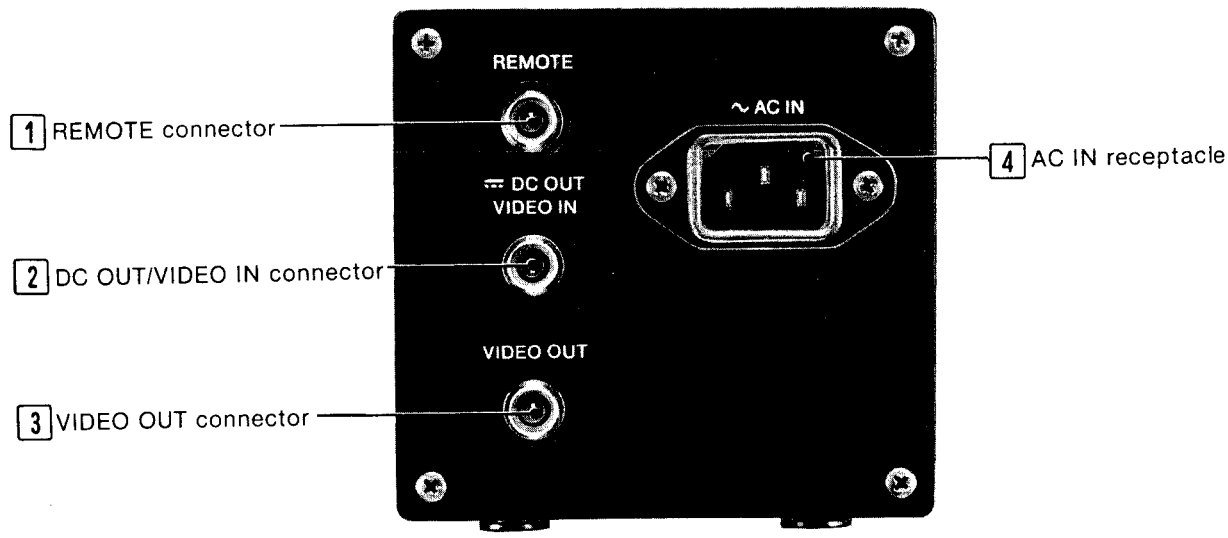
3 WHITE BAL (balance) selector
When the REMOTE connector of this unit and that of the camera are connected, the white balance can be adjusted with this selector regardless of the position of the WHITE BAL selector on the camera. (For details, refer to "White Balance Adjustment".)

4 PEDESTAL level control
When the REMOTE connector of this unit and that of the camera are connected, the pedestal level of the camera picture can be adjusted with this control. (For details, refer to "Pedestal Level Adjustment".)

5 CABLE COMP (compensation) selector
The degradation in the frequency response and in the output level caused by the camera cable extension between the camera and this unit can be compensated for by operating this selector. Select a selector position according to the cable length, as follows:

Cable length (m)	Selector position
Less than 100	0
About 100	100
200	200
300	300

Rear panel



1 REMOTE connector (BNC type)
Connect to the REMOTE connector of the camera to remotely control the white balance and the pedestal level adjustments.

Notes

- When this connector is connected to the camera, the camera can be remotely controlled by the adaptor. Also, the adaptor's operation takes priority over the camera's operation.
- If you wish to cancel the white balance control by this unit and to adjust the white balance by the camera, first turn off this unit, then disconnect the cable connecting the REMOTE connectors.
  If the cable is disconnected with this unit powered, the camera's white balance adjustment function will be inoperative. In this case, turn off the POWER switch, and after a few seconds, turn it on again, so that the adjustment function will be operative.

2 DC OUT (DC power output)/VIDEO IN (input) connector (BNC type)
DC power is supplied from this connector to the camera, and a video signal from the camera is input to this connector. Refer to "Connection Examples" on page 1-4.

3 VIDEO OUT (output) connector (BNC type)
A video signal is output from this connector. Refer to "Connection Examples" on page 1-4.

4 AC IN (AC input) receptacle
Connect to an AC outlet with the supplied AC power cord.

WARNING FOR THE CUSTOMERS IN THE UNITED KINGDOM

THIS APPARATUS MUST BE EARTHED

IMPORTANT

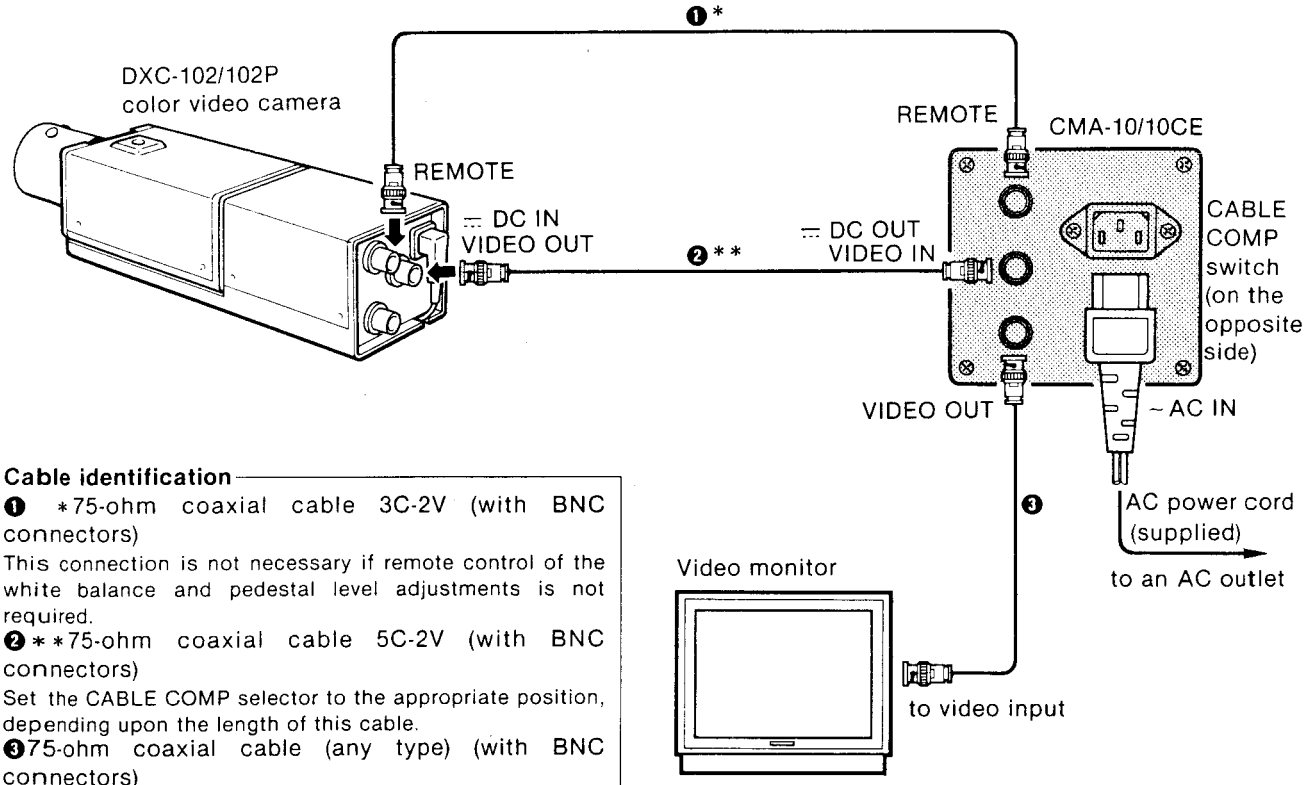
The wires in this mains lead are coloured in accordance with the following code:

Green-and-yellow:	Earth
Blue:	Neutral
Brown:	Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:
The wire which is coloured green-and-yellow must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol ⏚ or coloured green or green-and-yellow. The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black. The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

CONNECTION EXAMPLES

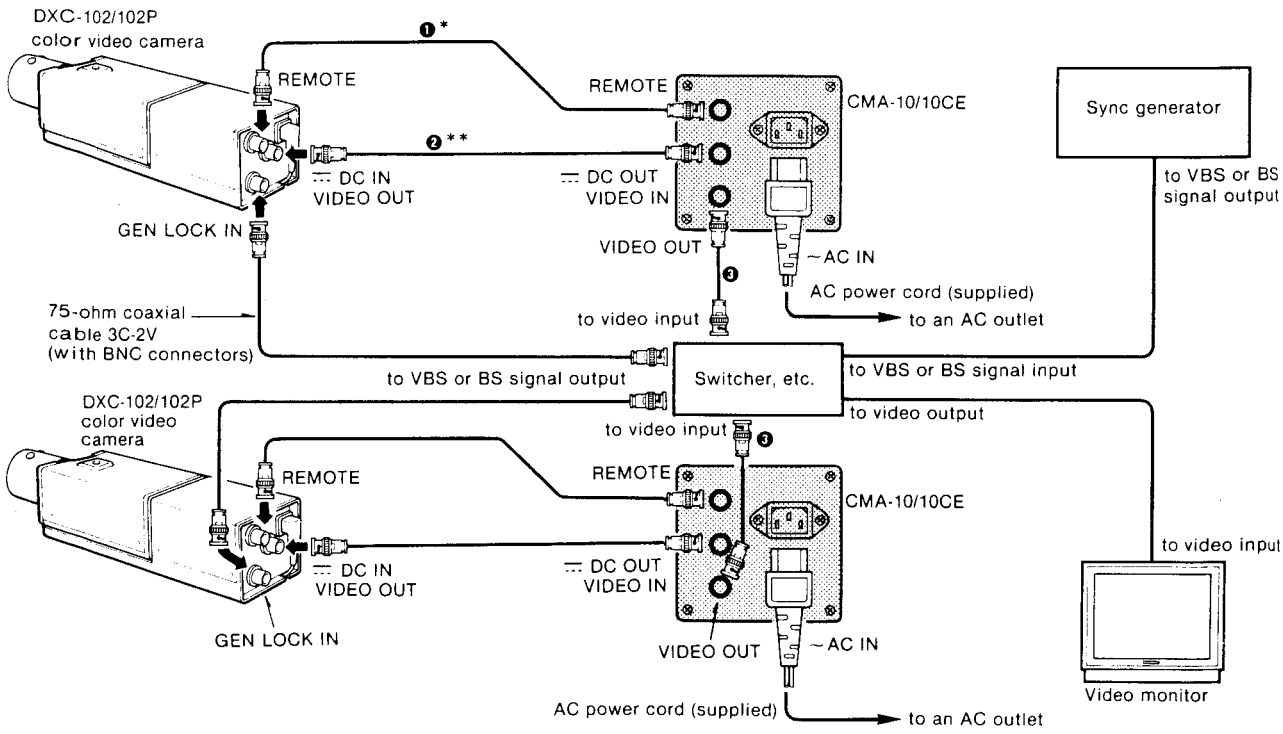
CONNECTION WITH ONE CAMERA



Cable identification

❶ *75-ohm coaxial cable 3C-2V (with BNC connectors)
This connection is not necessary if remote control of the white balance and pedestal level adjustments is not required.
❷**75-ohm coaxial cable 5C-2V (with BNC connectors)
Set the CABLE COMP selector to the appropriate position, depending upon the length of this cable.
❸75-ohm coaxial cable (any type) (with BNC connectors)

SYSTEM CONNECTION USING TWO CAMERAS



OPERATION

1 Turn on the POWER switch of the camera AC adaptor. The connected video camera will be turned on.
2 Turn on the connected video equipment (video monitor, VTR, etc.).

WHITE BALANCE ADJUSTMENT

There are two ways to adjust the white balance as described below.

To adjust the white balance to the factory-preset values
Select the position of the WHITE BAL selector depending on the lighting conditions.

Selector position	Lighting conditions
1	3200°K (Iodine lamp, sunrise, sunset)
2	Indoors (Fluorescent light)
3	Outdoors (Under a clear sky)

For better color setup according to lighting conditions (Automatic white balance adjustment)
Perform the procedure described below.
1 Set the WHITE BAL selector to AUTO.
2 Shoot a white object (a white cloth or a white wall) with the camera so that the white object fills the screen.
3 Press the AUTO WHITE BAL button.
When the automatic white balance adjustment is completed, the indicator lights up for a few seconds.

The white balance adjustment function may not operate in the following lighting conditions:
If the lighting is insufficient, the AUTO WHITE BAL indicator will not light up. This signifies that the white balance cannot be adjusted properly.
If the lighting is excessive, the AUTO WHITE BAL indicator will light up, even if the white balance cannot be adjusted properly. In this case, the entire monitor screen turns greenish to indicate that the white balance adjustment cannot be made properly.
In both cases, try to adjust the white balance again as follows.

When an auto iris lens is used:
If the lighting is insufficient, the white balance cannot be adjusted properly. Increase the lighting and press the AUTO WHITE BAL button again.

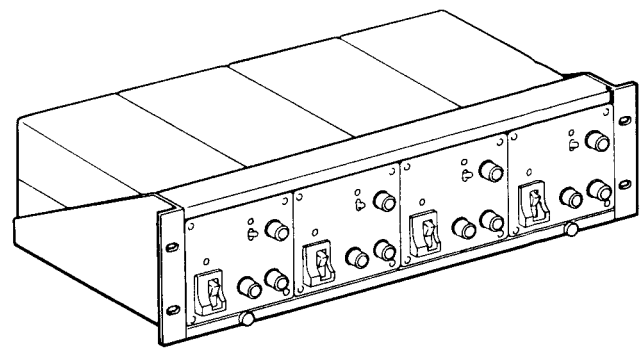
When a manual iris lens is used:
If the lighting is insufficient or excessive, the white balance cannot be adjusted properly. If the lighting is insufficient, open the iris or increase the lighting; if the lighting is excessive, stop down the lens iris. Then press the AUTO WHITE BAL button again.

PEDESTAL LEVEL ADJUSTMENT

The PEDESTAL level control adjusts the pedestal level of the camera picture. Normally set this control to the center position. When the pedestal level adjustment is required, use a waveform monitor for best results. If a waveform monitor is not available, display the color bar on the monitor and adjust the PEDESTAL control so that the black and white bars are black and white.

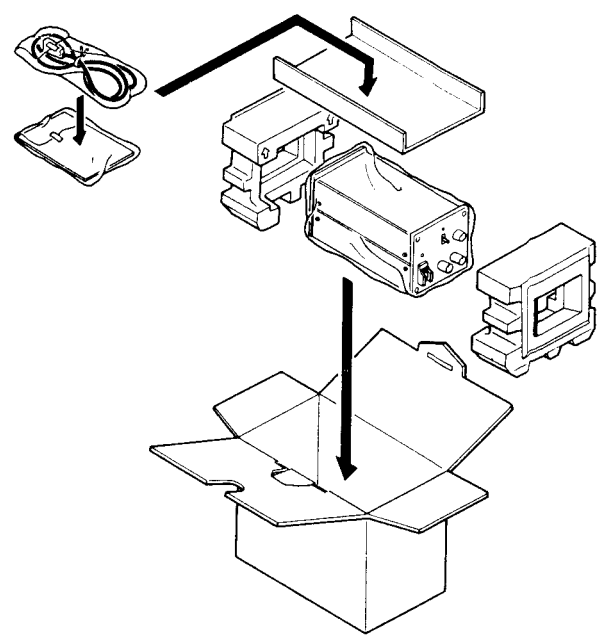
RACK MOUNTING

By using the RMM-1800 rack mounting bracket, it is possible to install four CMA-10/10CE camera AC adaptors into a standard 19-inch rack to create a well organized system.



REPACKING FOR SHIPMENT

The repacking procedure is subject to change. Refer to the packing instructions on the original carton as well as those shown here.



SECTION 2
ALIGNMENT

2-1. EQUIPMENT REQUIRED

DC Voltmeter

2-2. ADJUSTMENT

2-2-1. +48.5V Voltage Adjustment

Test point: CN3-1pin
Adj point: ◐RV1/PS-146 board
Spec: +48.5±0.5Vdc
NOTE: Be sure to be connected to DXC-102. (Show the right)

2-2-2. +9V Voltage Adjustment

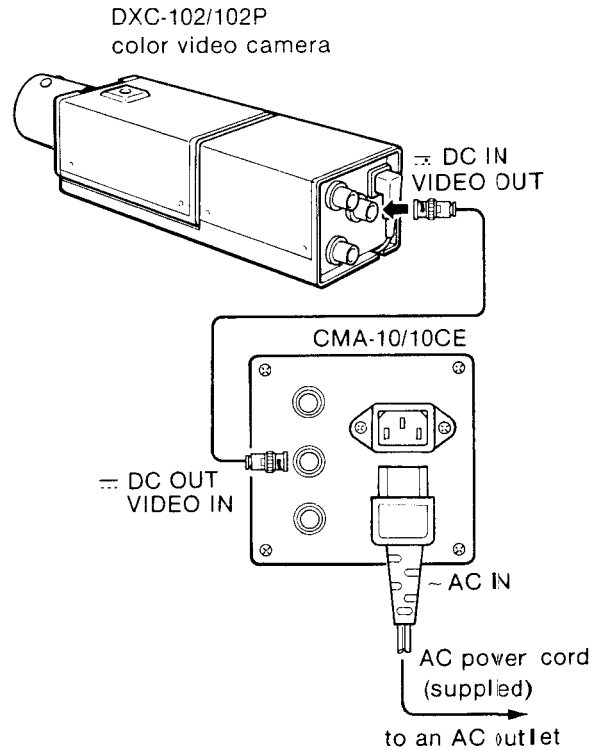
Tast point: CN6-1 pin
Adj point: ◐RV2/PS-146 board
Spec: +9.0±0.1Vdc

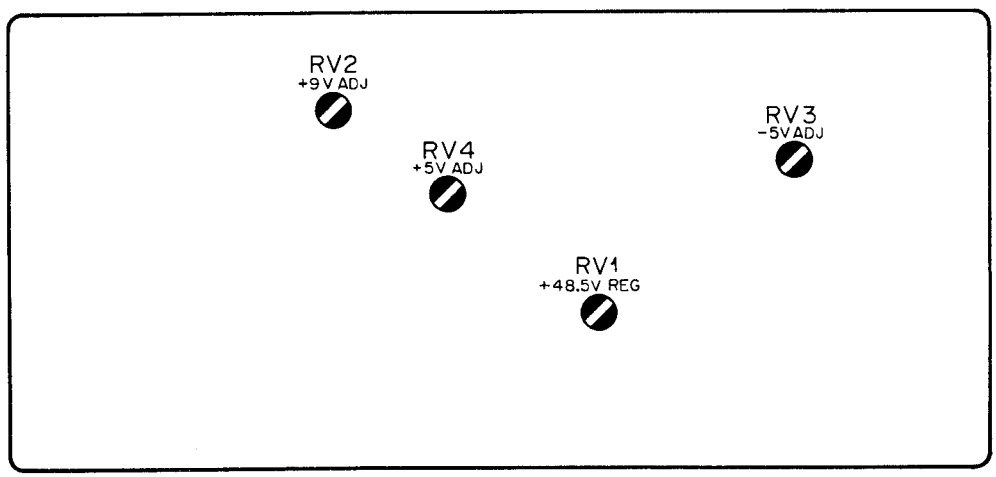
2-2-3. +5V Voltage Adjustment

Tast point: CN6-7 pin
Adj point: ◐RV4/PS-146 board
Spec: +5.0±0.1Vdc

2-2-4. −5V Voltage Adjustment

Tast point: CN6-3 pin
Adj point: ◐RV3/PS-146 board
Spec: −5.0±0.1Vdc

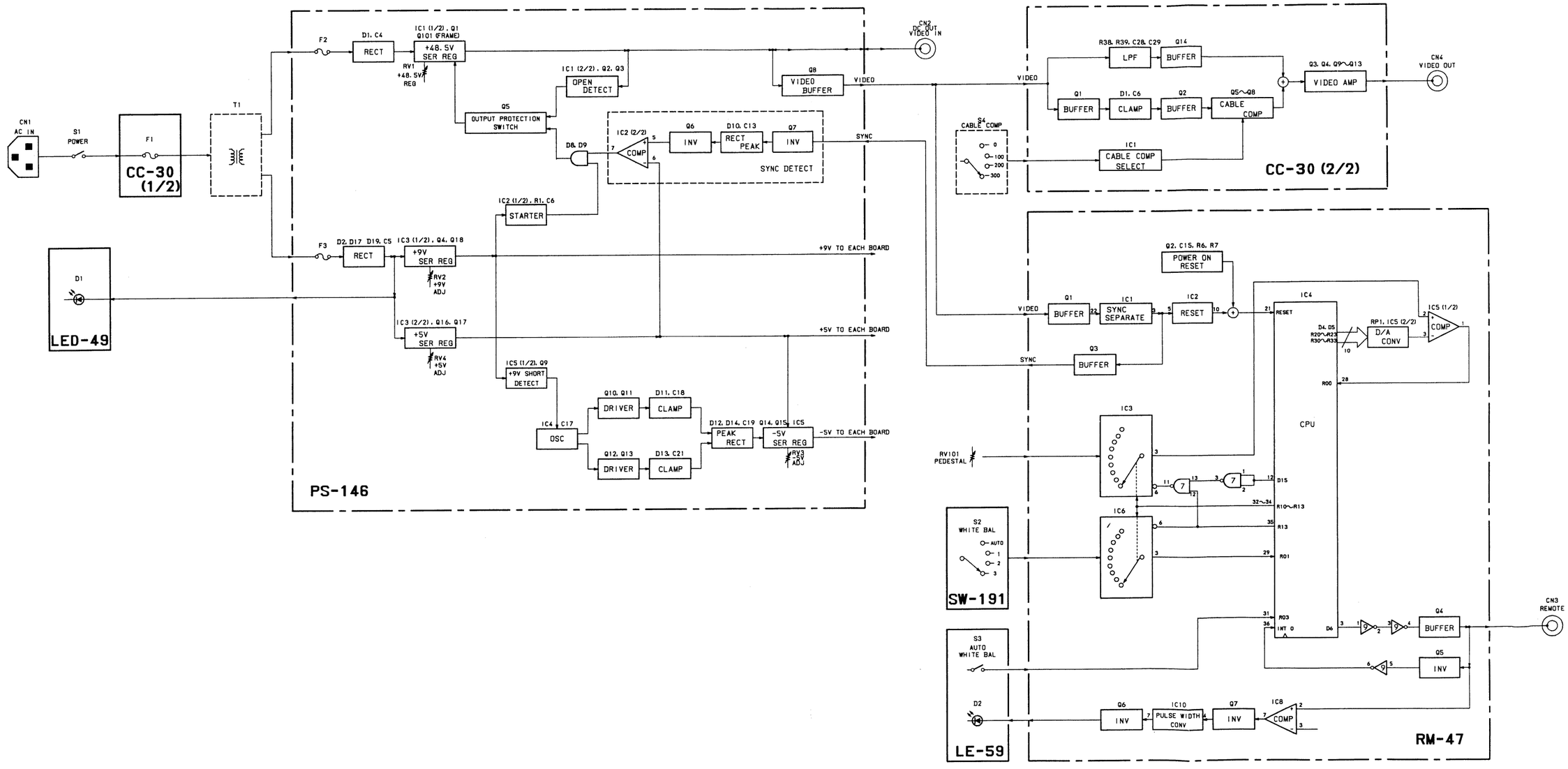




PS-146 board (component side)

SECTION 3
DIAGRAM

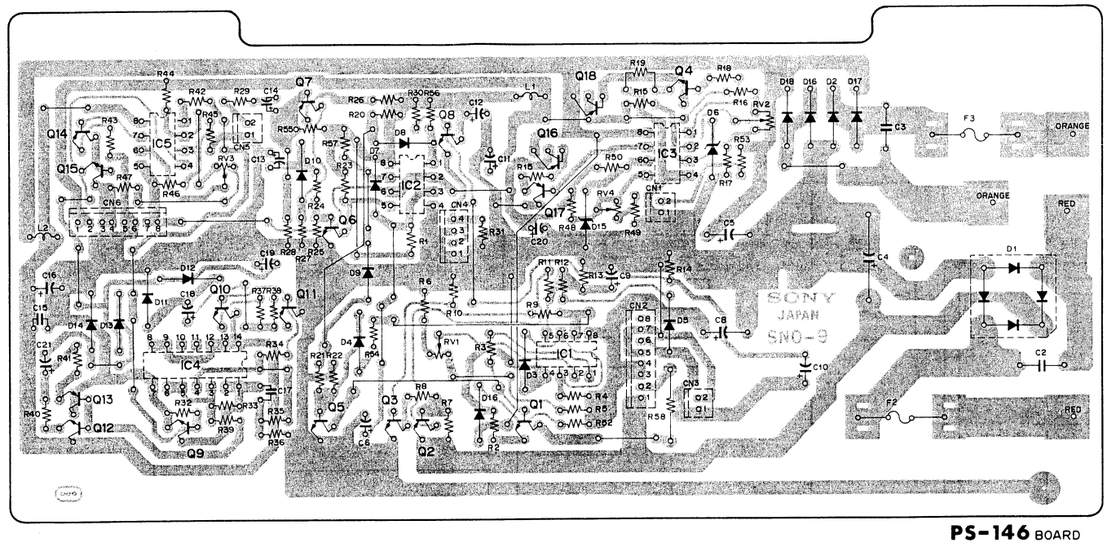
Overall Block Diagram



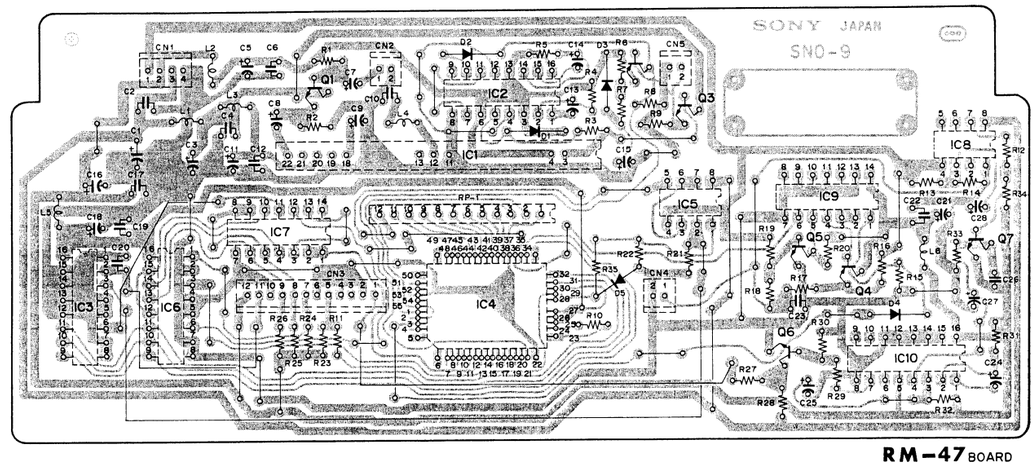
OVERALL BLOCK

CMA-10 (J, UC)
CMA-10CE (EK)

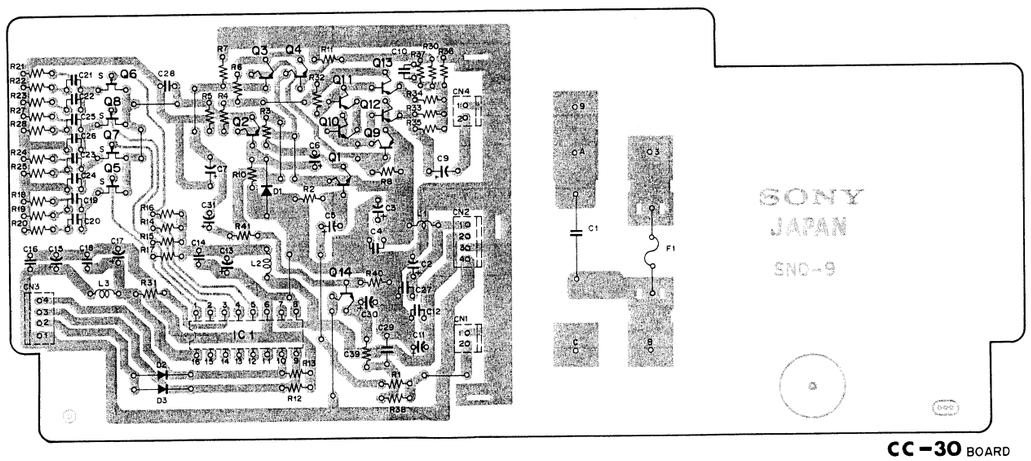
Mounting Diagram



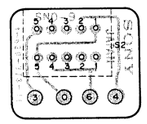
PS-146 BOARD
— SOLDERING SIDE —
1-620-373-11
CMA-10
CMA-10CE



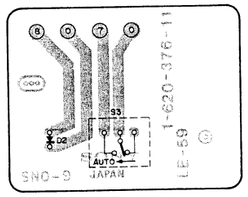
RM-47 BOARD
— SOLDERING SIDE —
1-620-374-11
CMA-10
CMA-10CE



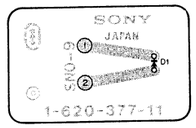
CC-30 BOARD
— SOLDERING SIDE —
1-620-375-11
CMA-10
CMA-10CE



SW-191 BOARD
— SOLDERING SIDE —
1-620-378-11
CMA-10
CMA-10CE

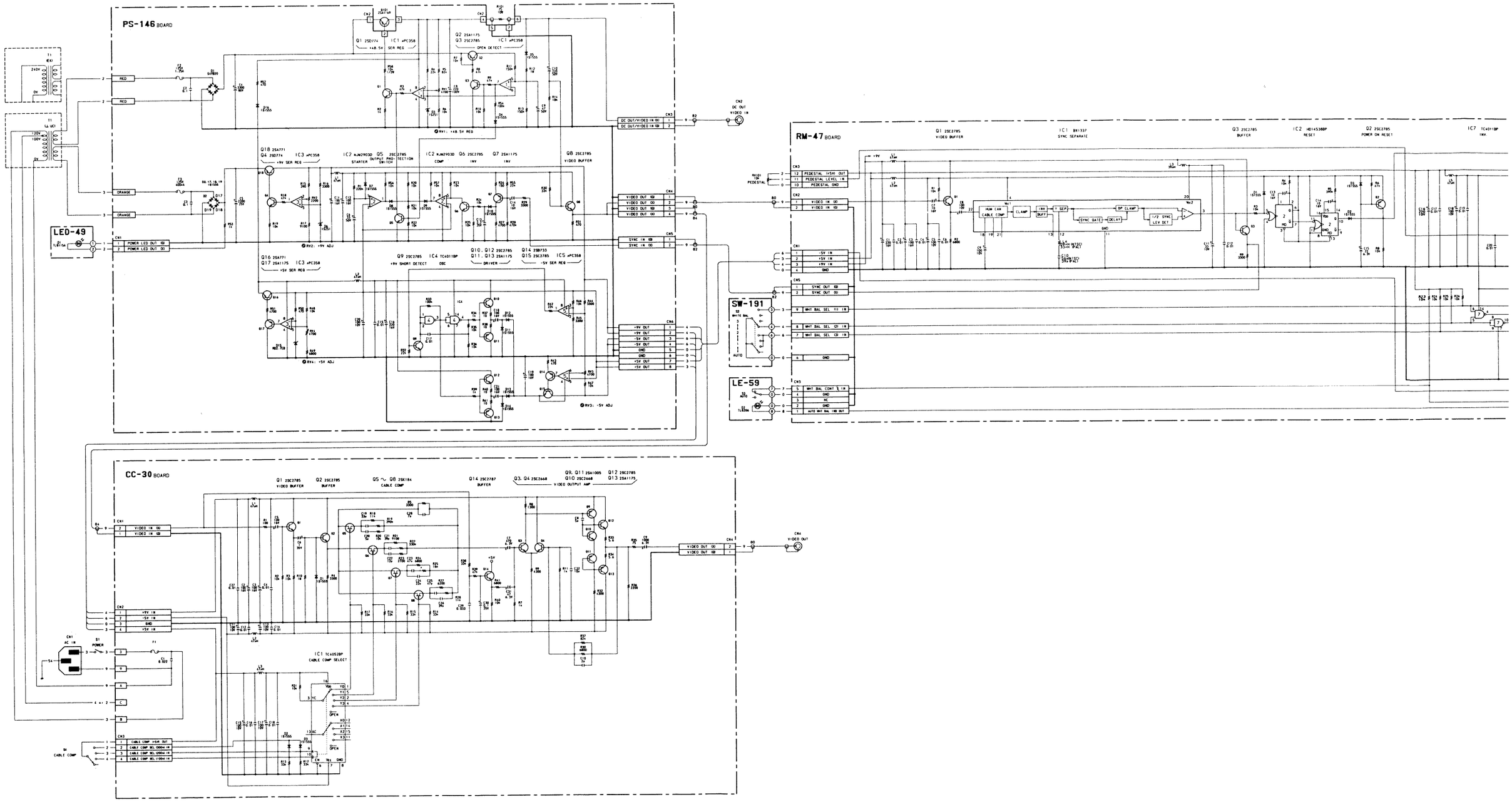


LE-59 BOARD
— SOLDERING SIDE —
1-620-376-11
CMA-10
CMA-10CE

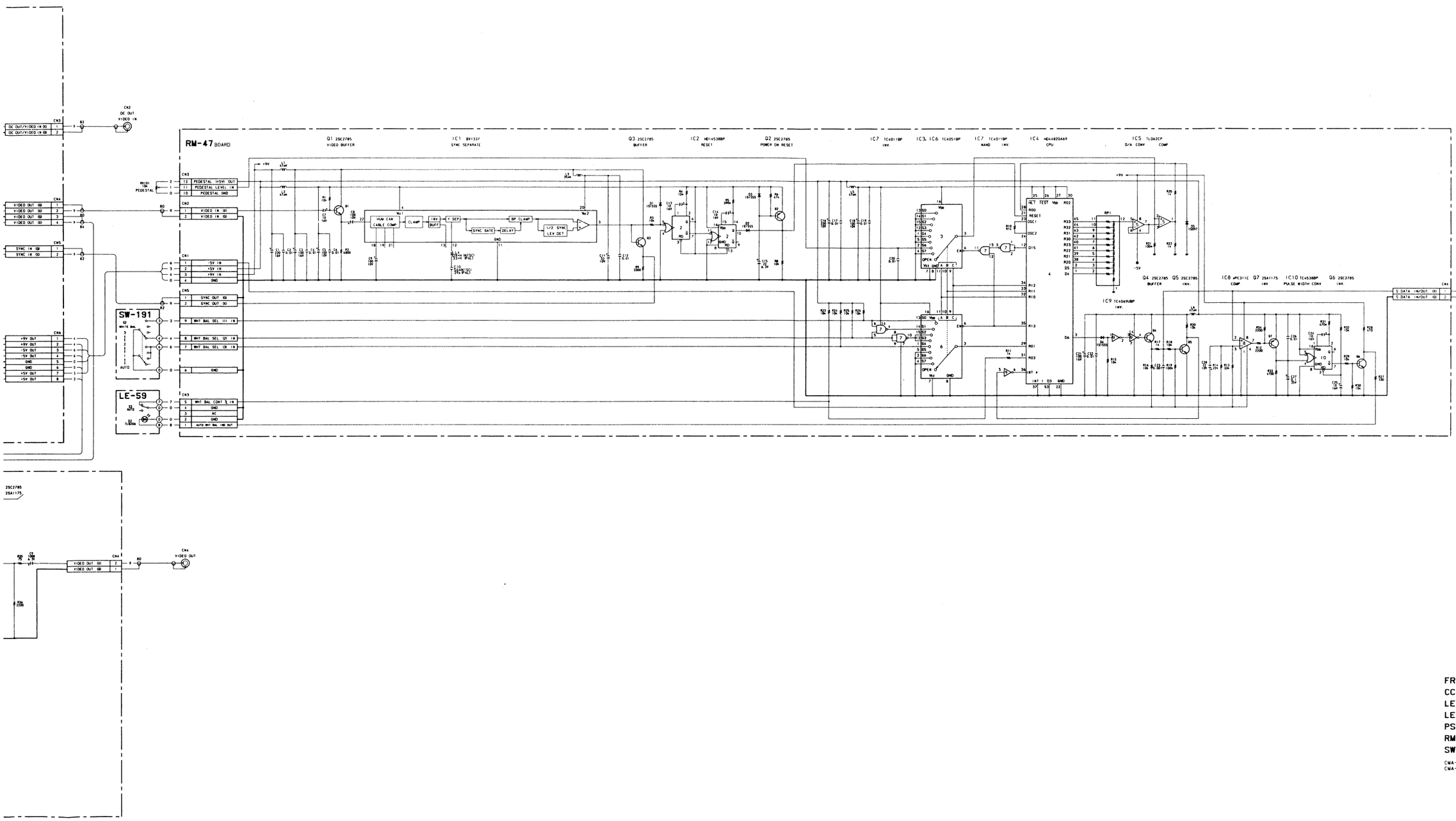


LED-49 BOARD
— SOLDERING SIDE —
1-620-377-11
CMA-10
CMA-10CE

Schematic Diagram



CMA-10/10CE


RM-47 BOARD
SW-191
LE-59
Q1 2SC2785 VIDEO BUFFER
IC1 BX1337 SYNC SEPARATE
Q3 2SC2785 BUFFER
IC2 HD14538BP RESET
Q2 2SC2785 POWER ON RESET
IC7 TC4011BP INV.
IC3, IC6 TC4051BP
IC7 TC4011BP NAND INV.
IC4 HD44820A69 CPU
IC5 TL062CP D/A CONV COMP
IC9 TC4049UBP INV.
Q4 2SC2785 BUFFER
Q5 2SC2785 INV.
IC8 μPC211C COMP
Q7 2SA1175 INV
IC10 TC4538BP PULSE WIDTH CONV
Q6 2SC2785 INV.
CN2 DC OUT VIDEO IN
CN3 DC OUT/VIDEO IN 00 / 01
CN4 VIDEO OUT 03 / 02 / 01 / 00
CN5 SYNC IN 03 / 00
CN6 +9V OUT / +9V OUT / -5V OUT / -5V OUT / GND / GND / +5V OUT
CN1 -5V IN / +5V IN / +5V IN / GND
CN5 SYNC OUT 03 / SYNC OUT 00
CN3 WHT BAL SEL (1) IN / WHT BAL SEL (2) IN / WHT BAL SEL (3) IN / GND
CN3 WHT BAL CONT L IN / GND / NC / GND / AUTO WHT BAL IND OUT
CN3 PEDESTAL (+5V) OUT / PEDESTAL LEVEL IN / PEDESTAL GND
CN2 VIDEO IN 01 / VIDEO IN 03
CN4 S DATA IN/OUT 01 / S DATA IN/OUT 03
CN4 REMOTE
RV101 PEDESTAL
SW2 WHITE BAL
AUTO
HET TEST
RESET
OSC1
OSC2
INT
GND

FRAME
CC-30
LE-59
LED-49
PS-146
RM-47
SW-191

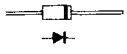
CMA-10 (J, UC)
CMA-10 (EK)

SECTION 4
SEMICONDUCTOR PIN ASSIGNMENTS

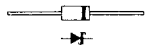
The circuit diagram of IC is obtained from the IC data book published by the manufacturer.

TYPE	PAGE
1S1555	4-2
1SS97	4-2
1SZ51	4-2
2SA1005	4-2
2SA1048	4-2
2SA1115	4-2
2SA1169	4-2
2SA1175	4-2
2SA771	4-2
2SA933S	4-2
2SB733	4-2
2SC1740S	4-2
2SC2458	4-2
2SC2603	4-2
2SC2668	4-2
2SC2785	4-2
2SC2787	4-2
2SD774	4-2
2SK184	4-2
BX1337	4-3
ERA81-004	4-2
HD14538BP	4-3
HD44820A69	4-3
NJM2903D	4-4
RD2.7EB	4-2
S4VB20	4-2
S4VB40	4-2

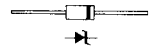
TYPE	PAGE
TC4011BP	4-4
TC4051BP	4-4
TC4052BP	4-4
TC4069UBP	4-4
TC4538BP	4-3
TL062CP	4-4
TLG115A	4-2
TLG206	4-2
uPC311C	4-4
uPC358C	4-4



1S1555



1SS97
ERA81-004



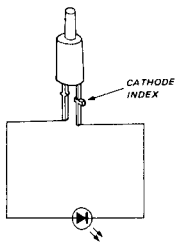
1SZ51
RD ? ?EB

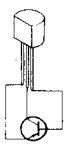
BOTTOM VIEW

S4VB20
S4VB40

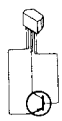
TLG115A : GREEN

TLG206 : GREEN

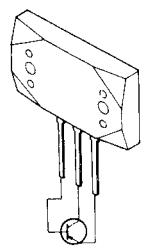




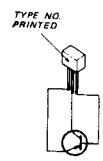
2SA1005



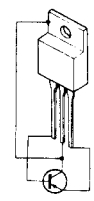
2SA1048
2SA1115
2SA933S



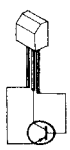
2SA1169



2SA1175

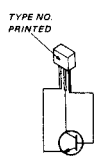


2SA771

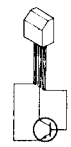


2SB733

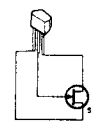
2SC1740S
2SC2458
2SC2603
2SC2668



2SC2785
2SC2787

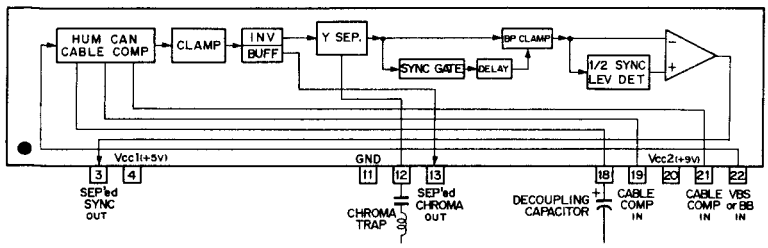


2SD774

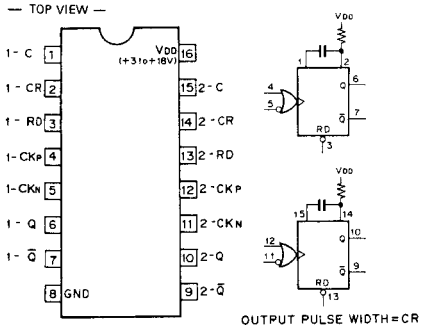


2SK184

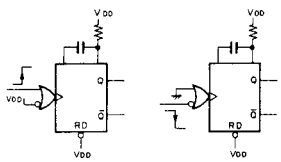
BX1337 (SONY)
SYNC SEPARATOR
— REAR VIEW —



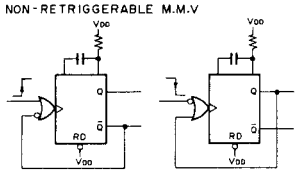
HD14538BP (HITACHI)
TC4538BP (TOSHIBA)
C-MOS DUAL RETRIGGERABLE/NON-RETRIGGERABLE MONOSTABLE MULTIVIBRATOR
— TOP VIEW —



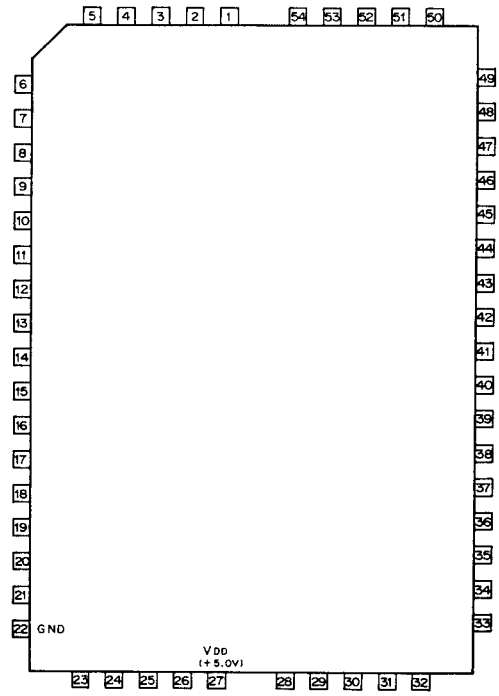
RETRIGGERABLE M.M.V

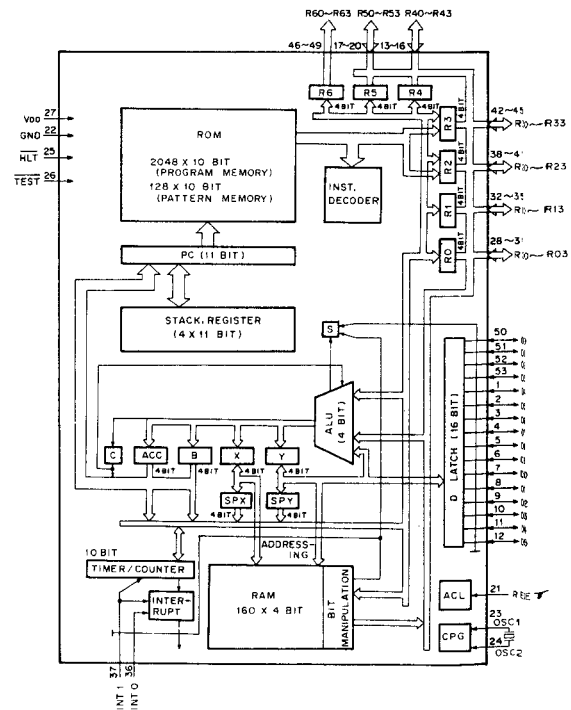


NON-RETRIGGERABLE M.M.V

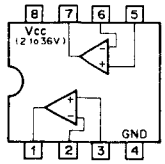


HD44820A69 (HITACHI) FLAT PACKAGE
C-MOS 4-BIT MICROPROCESSOR
— TOP VIEW —

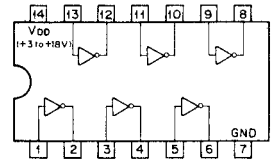


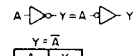


NJM2903D (JRC)
VOLTAGE COMPARATOR
— TOP VIEW —



TC4069UBP (TOSHIBA)
C-MOS INVERTER
— TOP VIEW —

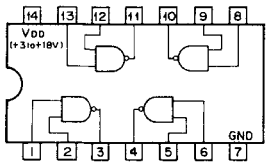


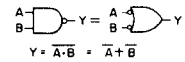


A	Y
0	1
1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

TC4011 BP (TOSHIBA)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —

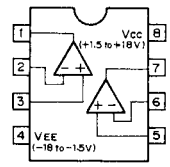




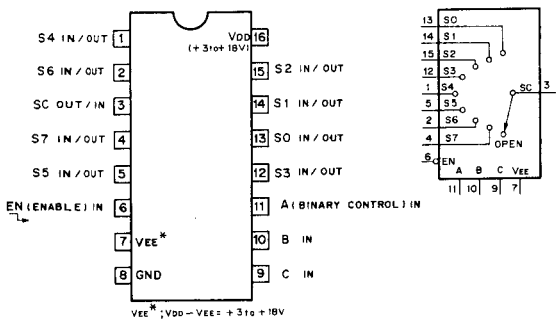
A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

0:LOW LEVEL
1:HIGH LEVEL

TL062CP (TI)
OPERATIONAL AMPLIFIER
(JFET INPUT)
— TOP VIEW —



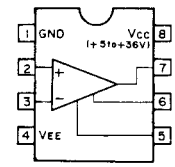
TC4051 BP (TOSHIBA)
C-MOS 8-CHANNEL MULTIPLEXER/DEMULTIPLEXER
— TOP VIEW —


S4 IN / OUT 1
S6 IN / OUT 2
SC OUT / IN 3
S7 IN / OUT 4
S5 IN / OUT 5
EN (ENABLE) IN 6
VEE* 7
GND 8
VDD 16
(+3 to+18V)
15 S2 IN / OUT
14 S1 IN / OUT
13 S0 IN / OUT
12 S3 IN / OUT
11 A (BINARY CONTROL) IN
10 B IN
9 C IN
VEE* ; VDD − VEE = +3 to +18V

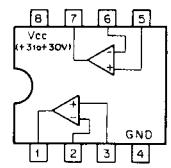
EN	C	B	A	"ON" CHANNEL
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	X	X	X	OPEN

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

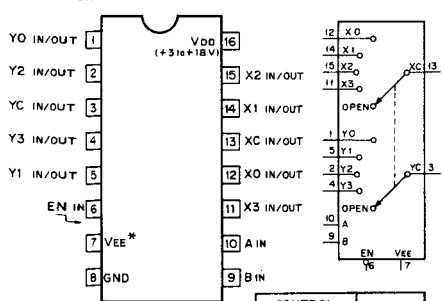
μPC311C (NEC)
VOLTAGE COMPARATOR
— TOP VIEW —



μPC358C (NEC)
DUAL OPERATIONAL AMPLIFIERS
— TOP VIEW —



TC4052 BP (TOSHIBA)
C-MOS 4-CHANNEL MULTIPLEXER/DEMULTIPLEXER
— TOP VIEW —



CONTROL INPUTS			"ON" CHANNEL
EN	B	A	
0	0	0	0
0	0	1	1
0	1	0	2
0	1	1	3
1	X	X	OPEN

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE.

SECTION 5
SPARE PARTS

5-1. PARTS INFORMATION

1. Safety Related Component Warning

Components identified by shading marked with ⚠ on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose parts numbers appear as shown in this manual or in service bulletins and service manual supplements published by Sony.

2. Replacement Parts supplied from Sony Parts Center will sometimes have different shape and outside view from the parts which actually in use. This is due to "**accommodating the improved parts and/or engineering changes**" or "**standardization of genuine parts.**"

   - This manual's exploded views and electrical spare parts lists are indicating the parts numbers of "the standardized genuine parts at present".
   - Regarding engineering parts changes in our engineering department, refer Sony service bulletins and service manual supplements.

3. **Printed Components in Bold-Face type** on the exploded views and electrical spare parts list are normally stocked for replacement purposes. The remaining parts are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

4. Item with no part number and/or no description are not stocked because they are seldom required for routine service.

5. **Abbreviation**

Ref. No.	DESCRIPTION	Ref. No.	DESCRIPTION	Ref. No.	DESCRIPTION
C	CAPACITOR	IC	IC	RP	RESISTOR BLOCK
CN	CONNECTOR	L	INDUCTOR	RV	UARIABLE RESISTOR
D	DIODE	Q	TRANSISTOR	S	SWITCH
F	FUSE	R	RESISTOR	T	TRANSFORMER

All capacitors are in micro farads unless otherwise specified.
All inductors are in micro henries unless otherwise specified.
All resistors are in ohms.

5-2. ELECTRICAL PARTS LIST

CARBON RESISTOR (1/6W)

±5%, 1/6W, non-special type
2.2Ω through 1MΩ

Parts No. 1-247-□□□-00

Value	Parts No. −□□□−	Value	Parts No. −□□□−	Value	Parts No. −□□□−	Value	Parts No. −□□□−
1Ω	–	36Ω	796	1.2kΩ	833	43kΩ	870
1.1	–	39	797	1.3	834	47	871
1.2	–	43	798	1.5	835	51	872
1.3	–	47	799	1.6	836	56	873
1.5	–	51	800	1.8	837	62	874
1.6	–	56	801	2	838	68	875
1.8	–	62	802	2.2	839	75	876
2	–	68	803	2.4	840	82	877
2.2	767	75	804	2.7	841	91	878
2.4	768	82	805	3	842	100kΩ	879
2.7	769	91	806	3.3	843	110	880
3	770	100Ω	807	3.6	844	120	881
3.3	771	110	808	3.9	845	130	882
3.6	772	120	809	4.3	846	150	883
3.9	773	130	810	4.7	847	160	884
4.3	774	150	811	5.1	848	180	885
4.7	775	160	812	5.6	849	200	886
5.1	776	180	813	6.2	850	220	887
5.6	777	200	814	6.8	851	240	888
6.2	778	220	815	7.5	852	270	889
6.8	779	240	816	8.2	853	300	890
7.5	780	270	817	9.1	854	330	891
8.2	781	300	818	10kΩ	855	360	892
9.1	782	330	819	11	856	390	893
10Ω	783	360	820	12	857	430	894
11	784	390	821	13	858	470	895
12	785	430	822	15	859	510	896
13	786	470	823	16	860	560	897
15	787	510	824	18	861	620	898
16	788	560	825	20	862	680	899
18	789	620	826	22	863	750	900
20	790	680	827	24	864	820	901
22	791	750	828	27	865	910	902
24	792	820	829	30	866	1MΩ	903
27	793	910	830	33	867		
30	794	1kΩ	831	36	868		
33	795	1.1	832	39	869		

CC-30 BOARD

⚠ A-7513-454-A MOUNTED CIRCUIT BOARD "CC-30"

Ref. No.	Parts No.	Description
C1	1-136-211-00	FILM 0.022 20% 250V
C2	1-124-143-00	ELECT 100 20% 16V
C3	1-124-143-00	ELECT 100 20% 16V
C4	1-161-013-00	CERAMIC 0.01 10% 25V
C5	1-124-143-00	ELECT 100 20% 16V
C6	1-131-347-00	TANTATUM 1 20% 35V
C7	1-124-135-00	ELECT 470 20% 6.3V
C8	1-102-942-00	CERAMIC 5PF ±0.5PF 50V
C9	1-124-136-00	ELECT 1000 20% 6.3V
C10	1-102-935-00	CERAMIC 2PF ±0.25PF 50V
C11	1-124-139-00	ELECT 100 20% 10V
C12	1-161-013-00	CERAMIC 0.01 10% 25V
C13	1-124-139-00	ELECT 100 20% 10V
C14	1-161-013-00	CERAMIC 0.01 10% 25V
C15	1-124-139-00	ELECT 100 20% 10V
C16	1-161-013-00	CERAMIC 0.01 10% 25V
C17	1-124-139-00	ELECT 100 20% 10V
C18	1-161-013-00	CERAMIC 0.01 10% 25V
C19	1-102-963-00	CERAMIC 33PF 10% 50V
C20	1-102-942-00	CERAMIC 5PF ±0.5PF 50V
C21	1-102-965-00	CERAMIC 39PF 5% 50V
C22	1-102-949-00	CERAMIC 12PF 10% 50V
C23	1-101-880-00	CERAMIC 47PF 10% 50V
C24	1-102-959-00	CERAMIC 22PF 5% 50V
C25	1-101-880-00	CERAMIC 47PF 10% 50V
C26	1-102-965-00	CERAMIC 39PF 5% 50V
C27	1-161-013-00	CERAMIC 0.01 10% 25V
C28	1-102-944-00	CERAMIC 7PF ±0.5PF 50V
C29	1-161-057-00	CERAMIC 0.033 10% 25V
C30	1-131-341-00	TANTALUM 0.1 20% 35V
C31	1-131-387-00	TANTALUM 47 20% 6.3V
C32	1-102-947-00	CERAMIC 10PF 5% 50V

Ref. No.	Parts No.	Description
CN1	1-560-456-00	RECEPTACLE, 2P MALE
	1-561-581-00	PLUG HOUSING 2P
	1-561-557-00	PLUG CONTACT
CN2	1-560-467-00	RECEPTACLE, 4P MALE
	1-561-585-00	PLUG HOUSING 4P
	1-561-557-00	PLUG CONTACT
CN3	1-560-467-00	RECEPTACLE, 4P MALE
	1-561-585-00	PLUG HOUSING 4P
	1-561-557-00	PLUG CONTACT
CN4	1-560-456-00	RECEPTACLE, 2P MALE
	1-561-581-00	PLUG HOUSING 2P
	1-561-557-00	PLUG CONTACT
D1	8-719-815-55	1S1555
D2	8-719-815-55	1S1555
D3	8-719-815-55	1S1555
⚠F1	1-532-737-11	GLASS TUBE 0.5A 125V (U, CA)
	1-533-037-21	HOLDER, FUSE
⚠F1	1-532-235-00	TIME-LAG 0.315A 250V (EK)
	1-533-037-21	HOLDER, FUSE
IC1	8-759-240-52	TC4052BP: TOSHIBA
L1	1-408-450-21	MICRO 47
L2	1-408-450-21	MICRO 47
L3	1-408-450-21	MICRO 47
Q1	8-729-178-54	2SC2785
Q2	8-729-178-54	2SC2785
Q3	8-729-266-83	2SC2668
Q4	8-729-266-83	2SC2668
Q5	8-729-218-42	2SK184
Q6	8-729-218-42	2SK184
Q7	8-729-218-42	2SK184
Q8	8-729-218-42	2SK184
Q9	8-729-110-53	2SA1005
Q10	8-729-266-83	2SC2668
Q11	8-729-110-53	2SA1005
Q12	8-729-178-54	2SC2785
Q13	8-729-117-54	2SA1175
Q14	8-729-178-73	2SC2787

Ref. No.	Parts No.	Description
LE-59 BOARD		
	1-620-376-11	PRINTED CIRCUIT BOARD "LE-59"
D2	**8-719-822-06**	**TLG206**
S3	**1-554-504-00**	**TOGGLE**
LED-49 BOARD		
	1-620-377-11	PRINTED CIRCUIT BOARD "LED-49"
D1	**8-719-820-15**	**TLG115A**

Ref. No.	Parts No.	Description
PS-146 BOARD		
	A-7513-458-A	MOUNTED CIRCUIT BOARD "PS-146"
C2	**1-108-389-00**	**MYLAR 0.1 10% 100V**
C3	**1-108-389-00**	**MYLAR 0.1 10% 100V**
C4	**1-126-115-11**	**ELECT 3300 20% 80V**
C5	**1-123-338-00**	**ELECT 2200 20% 25V**
C6	**1-124-157-11**	**ELECT 33 20% 50V**
C8	**1-123-389-00**	**ELECT 220 20% 100V**
C9	**1-124-158-00**	**ELECT 47 20% 50V**
C10	**1-124-160-11**	**ELECT 220.0002 50V**
C11	**1-124-143-00**	**ELECT 100 20% 16V**
C12	**1-124-143-00**	**ELECT 100 20% 16V**
C13	**1-131-349-00**	**TANTALUM 2.2 20% 35V**
C14	**1-123-617-00**	**ELECT 10 20% 16V**
C15	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C16	**1-124-144-00**	**ELECT 220 20% 16V**
C17	**1-161-013-00**	**CERAMIC 0.01 10% 25V**
C18	**1-124-143-00**	**ELECT 100 20% 16V**
C19	**1-124-143-00**	**ELECT 100 20% 16V**
C20	**1-124-139-00**	**ELECT 100 20% 10V**
C21	**1-124-143-00**	**ELECT 100 20% 16V**
CN1	1-560-456-00	RECEPTACLE, 2P MALE
	1-561-581-00	PLUG HOUSING 2P
	1-561-557-00	PLUG CONTACT
CN2	1-560-470-00	RECEPTACLE, 8P MALE
	1-561-588-00	PLUG HOUSING 8P
	1-561-557-00	PLUG CONTACT
CN3	1-560-456-00	RECEPTACLE, 2P MALE
	1-561-581-00	PLUG HOUSING 2P
	1-561-557-00	PLUG CONTACT
CN4	1-560-467-00	RECEPTECLE, 4P MALE
	1-561-585-00	PLUG HOUSING 4P
	1-561-557-00	PLUG CONTACT
CN5	1-560-456-00	RECEPTACLE, 2P MALE
	1-561-581-00	PLUG HOUSING 2P
	1-561-557-00	PLUG CONTACT
CN6	1-560-470-00	RECEPTACLE, 8P MALE
	1-561-588-00	PLUG HOUSING 8P
	1-561-557-00	PLUG CONTACT

Ref. No.	Parts No.	Description
D1	8-719-504-40	S4VB40
D2	8-719-981-01	ERA81-004
D3	8-719-102-51	1SZ51
D4	8-719-815-55	1S1555
D5	8-719-815-55	1S1555
D6	8-719-102-51	1SZ51
D7	8-719-815-55	1S1555
D8	8-719-815-55	1S1555
D9	8-719-815-55	1S1555
D10	8-719-815-55	1S1555
D11	8-719-815-55	1S1555
D12	8-719-815-55	1S1555
D13	8-719-815-55	1S1555
D14	8-719-815-55	1S1555
D15	8-719-127-07	RD2.7EB
D16	8-719-815-55	1S1555
D17	8-719-981-01	ERA81-004
D18	8-719-981-01	ERA81-004
D19	8-719-981-01	ERA81-004
IC1	8-759-135-80	μPC358C: NEC
IC2	8-759-729-03	NJM2903D: RCA
IC3	8-759-135-80	μPC358C: NEC
IC4	8-759-240-11	TC4011BP: TOSHIBA
IC5	8-759-135-80	μPC358C: NEC

Ref. No.	Parts No.	Description
L1	1-408-450-21	MICRO 47
L2	1-408-450-21	MICRO 47
Q1	8-729-177-43	2SD774
Q2	8-729-117-54	2SA1175
Q3	8-729-178-54	2SC2785
Q4	8-729-177-43	2SD774
Q5	8-729-178-54	2SC2785
Q6	8-729-178-54	2SC2785
Q7	8-729-117-54	2SA1175
Q8	8-729-178-54	2SC2785
Q9	8-729-178-54	2SC2785
Q10	8-729-178-54	2SC2785
Q11	8-729-117-54	2SA1175
Q12	8-729-178-54	2SC2785
Q13	8-729-117-54	2SA1175
Q14	8-729-113-33	2SB733-4
Q15	8-729-178-54	2SC2785
Q16	8-729-377-12	2SA771
Q17	8-729-117-54	2SA1175
Q18	8-729-377-12	2SA771

⚠F1	1-532-736-11	GLASS TUBE 0.4A 125V (U, CA)
⚠F1	1-532-066-00	TIME-LAG 0.4A 250V (EK)
	1-533-037-21	HOLDER, FUSE
⚠F2	1-532-285-00	TIME-LAG 1.25A 250V (EK)
	1-533-037-21	HOLDER, FUSE (EK)

Ref. No.	Parts No.	Description
RV1	1-230-522-11	METAL 4.7K
RV2	1-226-702-00	METAL 2.2K
RV3	1-230-522-11	METAL 4.7K
RV4	1-230-522-11	METAL 4.7K
S1	1-552-741-00	REC P/B

RM-47 BOARD

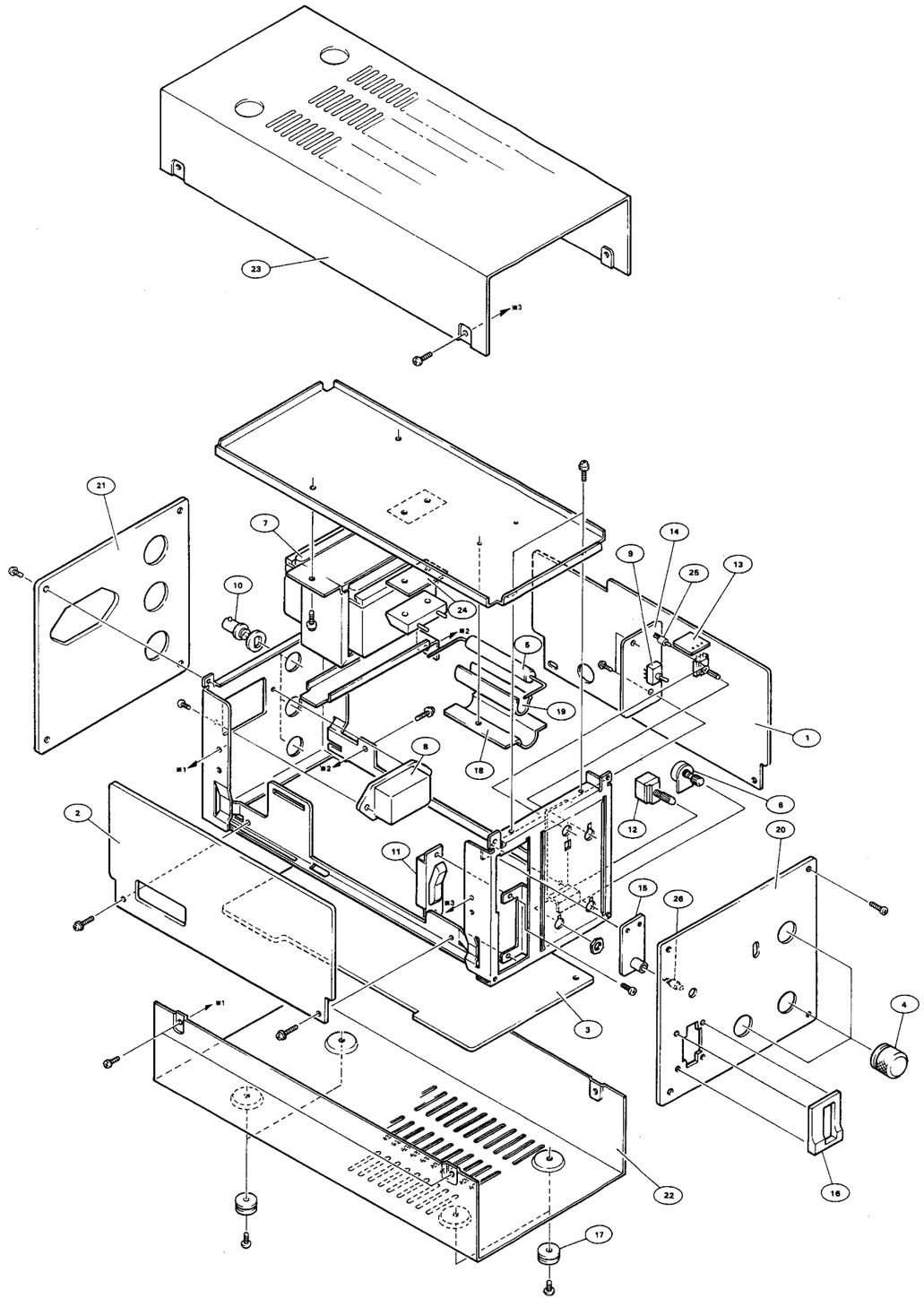
Ref. No.	Parts No.	Description
	A-7513-456-A	MOUNTED CIRCUIT BOARD "RM-47"
C1	1-124-144-00	ELECT 220 20% 16V
C2	1-161-013-00	CERAMIC 0.01 10% 25V
C3	1-124-143-00	ELECT 100 20% 16V
C4	1-161-013-00	CERAMIC 0.01 10% 25V
C5	1-124-139-00	ELECT 100 20% 10V
C6	1-161-013-00	CERAMIC 0.01 10% 25V
C7	1-123-617-00	ELECT 10 20% 16V
C8	1-124-139-00	ELECT 100 20% 10V
C9	1-124-139-00	ELECT 100 20% 10V
C10	1-101-884-00	CERAMIC 56PF 5% 50V (U, CA)
	1-102-965-00	CERAMIC 39PF 5% 50V (EK)
C11	1-131-380-00	TANTALUM 33 10% 10V
C12	1-161-013-00	CERAMIC 0.01 10% 25V
C13	1-131-371-00	TANTALUM 10 10% 16V
C14	1-131-371-00	TANTALUM 10 10% 16V
C15	1-123-618-00	ELECT 22 20% 6.3V
C16	1-124-140-00	ELECT 220 20% 10V
C17	1-161-013-00	CERAMIC 0.01 10% 25V
C18	1-124-139-00	ELECT 100 20% 10V
C19	1-161-013-00	CERAMIC 0.01 10% 25V
C20	1-161-013-00	CERAMIC 0.01 10% 25V
C21	1-124-139-00	ELECT 100 20% 10V
C22	1-161-013-00	CERAMIC 0.01 10% 25V
C23	1-161-039-00	CERAMIC 0.001 10% 25V
C24	1-131-371-00	TANTALUM 10 10% 16V
C25	1-123-617-00	ELECT 10 20% 16V
C26	1-161-013-00	CERAMIC 0.01 10% 25V
C27	1-131-341-00	TANTALUM 0.1 20% 35V
C28	1-131-379-00	TANTALUM 22 20% 10V
CN1	1-560-467-00	RECEPTACLE, 4P MALE
	1-561-585-00	PLUG HOUSING 4P
	1-561-557-00	PLUG CONTACT
CN2	1-560-456-00	RECEPTACLE, 2P MALE
	1-561-581-00	PLUG HOUSING 2P
	1-561-557-00	PLUG CONTACT
CN3	1-560-472-00	RECEPTACLE, 12P MALE
	1-561-590-00	PLUG HOUSING 12P
	1-561-557-00	PLUG CONTACT
CN4	1-560-456-00	RECEPTACLE, 2P MALE
	1-561-581-00	PLUG HOUSING 2P
	1-561-557-00	PLUG CONTACT
CN5	1-560-456-00	RECEPTACLE, 2P MALE
	1-561-581-00	PLUG HOUSING 2P
	1-561-557-00	PLUG CONTACT

Ref. No.	Parts No.	Description
D1	8-719-815-55	1S1555
D2	8-719-815-55	1S1555
D3	8-719-815-55	1S1555
D4	8-719-815-55	1S1555
IC1	8-741-133-70	BX1337: SONY
IC2	8-759-345-38	HD14538BP: HITACHI
IC3	8-759-240-51	TC4051BP: TOSHIBA
IC4	8-759-300-06	HD44820A-69: HITACHI
IC5	8-759-990-62	TL062CP: TI
IC6	8-759-240-51	TC4051BP: TOSHIBA
IC7	8-759-240-11	TC4011BP: TOSHIBA
IC8	8-759-131-11	μPC311C: NEC
IC9	8-759-240-69	TC4069UBP: TOSHIBA
IC10	8-759-345-38	HD14538BP: HITACHI
L1	1-408-450-21	MICRO 47
L2	1-408-450-21	MICRO 47
L3	1-408-449-21	MICRO 39
L4	1-408-449-21	MICRO 39 (U, CA)
	1-408-415-00	MICRO 33 (EK)
L5	1-408-450-21	MICRO 47
L6	1-408-450-21	MICRO 47
Q1	8-729-178-54	2SC2785
Q2	8-729-117-54	2SA1175
Q3	8-729-178-54	2SC2785
Q4	8-729-178-54	2SC2785
Q5	8-729-178-54	2SC2785
Q6	8-729-178-54	2SC2785
Q7	8-729-117-54	2SA1175
RP1	1-232-509-00	LADDER 25K

Ref. No.	Parts No.	Description
SW-191 BOARD		
	1-620-378-11	PRINTED CIRCUIT BOARD "SW-191"
S2	**1-570-817-11**	**ROTARY**

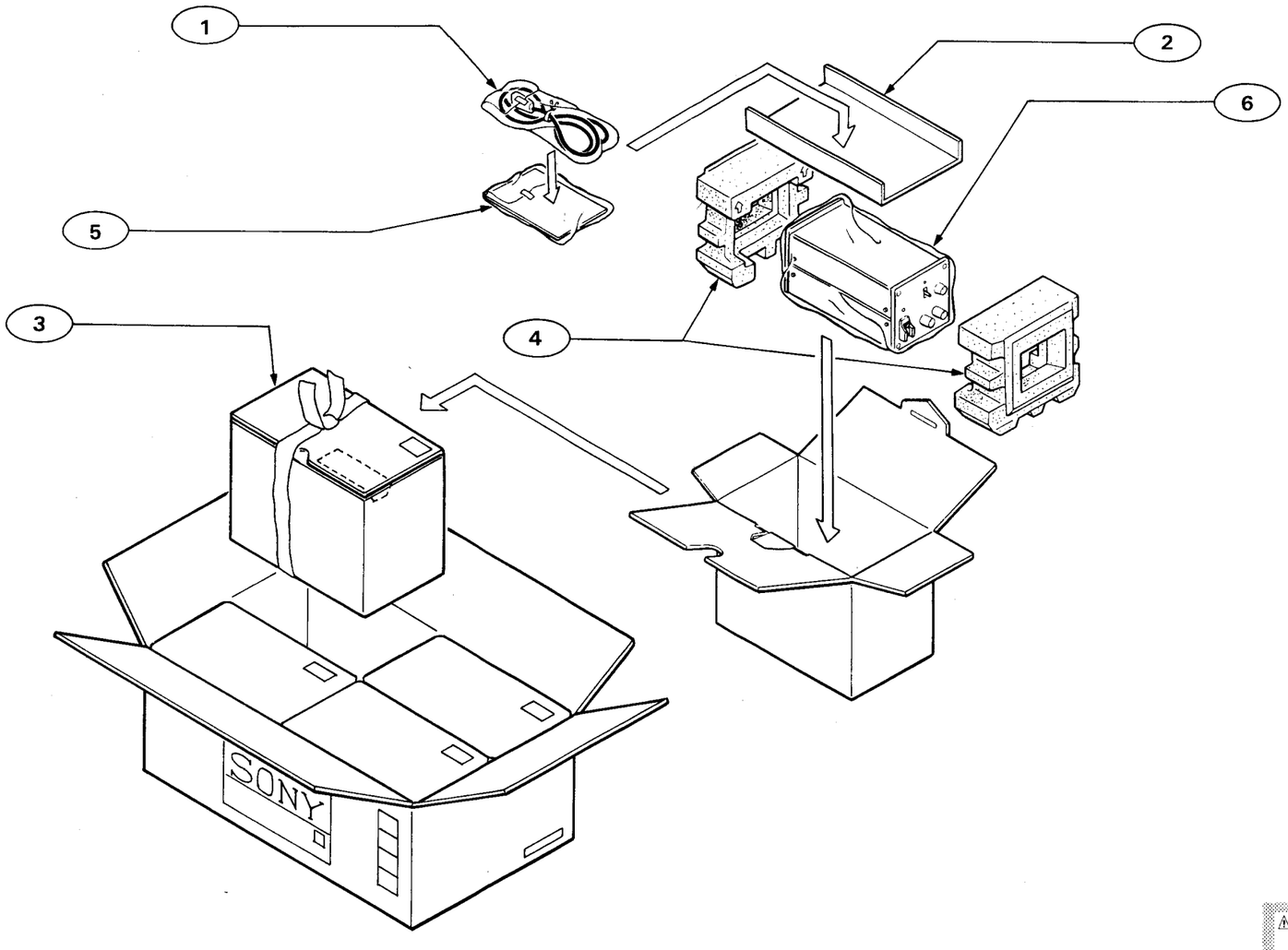
Ref. No.	Parts No.	Description
FRAME		
⚠CN1	**1-509-546-00**	**AC IN**
CN2	**1-561-781-41**	**RECEPTACLE, BNC "VIDEO IN"**
CN3	**1-561-781-41**	**RECEPTACLE, BNC "SERIAL DATA"**
CN4	**1-561-781-41**	**RECEPTACLE, BNC "VIDEO OUT"**
Q1	**8-729-316-91**	**2SA1169**
⚠R1	**1-217-698-11**	**WIREWOUND 75 1% 10W**
RV1	**1-226-916-00**	**CARBON 10K**
⚠S1	**1-570-117-11**	**SEESAW "POWER"**
S4	**1-570-817-11**	**ROTARY "CABLE COMP"**
⚠T1	**1-448-697-11**	**POWER (U, CA)**
	1-448-696-11	**POWER (EK)**

5-3. EXPLODED VIEW



No.	Parts No.	Description
⚠1	A-7513-454-A	MOUNTED CIRCUIT BOARD "CC-30"
⚠2	A-7513-456-A	MOUNTED CIRCUIT BOARD "RM-47"
3	A-7513-458-A	MOUNTED CIRCUIT BOARD "PS-146"
4	**X-3661-073-0**	**KNOB ASSY, CONTROL**
⚠**5**	**1-217-698-11**	**RES, WIREWOUND 75**
6	**1-226-916-00**	**RES, VAR, CARBON 10K**
⚠**7**	**1-448-697-11**	**TRANSFORMER, POWER**
⚠**8**	**1-509-546-00**	**3P INLET**
9	**1-554-504-00**	**SWITCH, TOGGLE**
10	**1-561-781-41**	**CONNECTOR, BNC**
⚠**11**	**1-570-117-11**	**SWITCH, SEESAW (AC POWER)**
12	**1-570-817-11**	**SWITCH, ROTARY**
13	1-620-378-11	PRINTED CIRCUIT BOARD "SW-191"
14	1-620-376-11	PRINTED CIRCUIT BOARD "LE-59"
15	1-620-377-11	PRINTED CIRCUIT BOARD "LED-49"
16	2-251-642-00	GUARD, POWER SWITCH
17	2-279-001-00	FOOT
18	2-394-220-01	BRACKET, RESISTOR
19	2-394-221-01	SHEET (R), HEAT SINK
20	2-394-226-01	PANEL, FRONT
21	2-394-227-01	PANEL, REAR
22	2-394-229-01	COVER, LOWER
23	2-394-230-01	COVER, UPPER
24	**4-885-901-21**	**SHEET, RADIATION**
25	**8-719-822-06**	**DIODE TLG206**
26	**8-719-820-15**	**DIODE TLG115A**

5-4. PACKING MATERIAL



No.	Parts No.	Description
⚠1	**1-551-812-00**	**CORD, POWER (U, CA)**
	1-556-760-11	**CORD, POWER (EK)**
2	2-394-214-01	SPACER
3	2-394-215-01	INDIVIDUAL CARTON
4	2-394-216-01	CUSHION
5	3-701-625-00	BAG, POLYETHYLENE
	3-760-862-11	MANUAL, INSTRUCTION
6	3-701-633-00	BAG, POLYETHYLENE (FOR CMA-10/CE)

CMA-10/10CE (U,CA,EK)
9-966-869-01

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